

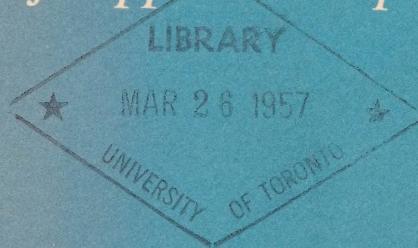
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BULLETIN No. 2

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A MODERN CONCEPT
OF
APPRENTICESHIP

The Story of Apprenticeship in Alberta



Prepared by the Information Branch
for the Vocational Training Branch

DEPARTMENT OF LABOUR - CANADA



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Price 25 cents

INDEX

SECTION I — INTRODUCTION.....	7
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SECTION II — ALBERTA APPRENTICESHIP PROGRAM

Origin of Alberta Program.....	8
Tradesmen's Qualification Act.....	9
Administration of Program.....	9
Provincial Apprenticeship Board.....	9
Local Advisory Committees.....	10
Provincial Advisory Committees.....	10
Duties of Provincial Director.....	11
Director of Apprenticeship and Staff.....	11
Formation of First Committees.....	11
Arrangement of Technical Training.....	12
Early Problems.....	12
Terms of Apprenticeship.....	13
Time Credits.....	13
Noteworthy Feature.....	14
Ratios of Apprentices to Journeymen.....	14
Educational Requirements.....	14
Employers Responsibility.....	14
Technical School Training.....	15
Financial Allowances During School Training.....	15

SECTION III — TRADES DESIGNATED UNDER THE ACT

BRICKLAYING AND MASONRY TRADES.....	16
An Employer's Comments.....	16
CARPENTRY.....	16
An Employer's Opinion.....	17
PLASTERING.....	18
Opinion of an Employer and Apprentice.....	18
SHEET METAL TRADE.....	18
Practical Work at School.....	19
Theoretical and Academic Training.....	19
PLUMBERS, STEAMFITTERS AND GASFITTERS.....	20
A Plumbing Contractor's Opinion.....	20
PAINTERS AND DECORATORS.....	21
ELECTRICAL TRADE.....	21
THE WELDING TRADE.....	22
Eight Specific Objectives.....	23
MACHINISTS.....	24
RADIO AND TELEVISION TECHNICIANS.....	24
REFRIGERATION MECHANICS.....	25

SECTION IV — MOTOR VEHICLE REPAIR TRADES

Motor Mechanics.....	26
Auto Body Workers.....	27
Differences of Opinion Among Employers.....	27
Our Firm's Training System	28

SECTION V — SUMMARY AND STATISTICS

Outstanding Features.....	30
Statistics	31

Foreword

This bulletin tells the story of the provincial apprenticeship program in Alberta as presented by provincial officials, by instructors who are training young persons under the program, by employers to whom apprentices are indentured and by apprentices and others directly concerned. It supplements an earlier bulletin describing the system of apprenticeship in the Province of Quebec.

Since the Alberta program is very similar to those in the remaining provinces, the two bulletins should give a fairly comprehensive story of the types of apprenticeship training being developed on a co-operative basis by industry, as represented by employers and unions and by government, as represented by the provincial departments of Labour and Education.

Factual statements were provided by provincial officials and the comments and opinions contained in the bulletin represent the local and provincial point of view rather than the opinions of federal officials or of the federal Department of Labour. Such statements and comments have been checked with the authors and persons interviewed to avoid errors or misinterpretation.

It is hoped that the bulletin will not only provide useful and interesting information regarding the program which is being developed in Alberta, but will also stimulate interest in apprenticeship and be helpful to those persons who are striving to develop better training programs and higher standards of achievement for young persons entering skilled trades in Canadian industry.

SECTION I

Introduction

A modern system of apprenticeship has been spreading throughout many parts of Canada since the end of World War 2. It might be regarded as the new Canadian concept. This new concept recognizes "journeyman status" as the attainment of definite standards of practical skill and theoretical knowledge rather than the automatic result of serving a specified number of years of experience in the trade. Under such a concept emphasis is laid on the passing of practical tests to prove skill and written examinations to prove theoretical knowledge.

This new concept brings a new meaning to the word "apprenticeship". For many years "apprenticeship" has been associated in most people's minds with an indenture-ship involving the serving of a lengthy period of time with craftsmen. The word became generally accepted as meaning a time-serving process. Today, however, under the modern concept the word "apprenticeship" is becoming synonymous with "training". It is considered by advocates of this modern concept as meaning a period of organized supervised training.

Proponents of this new Canadian concept feel that higher standards of competence and more uniformity can be reached by tradesmen having to pass standardized tests and examinations. They claim that the older concept of "time-serving" held no positive assurance of competence or uniform standards. They readily admit that many apprentices became highly skilled craftsmen by serving a specified length of time with an employer. However, the apprentice's training was entirely dependent on the knowledge, skill and interest of his employer or the journeymen with whom he worked.

Industrial techniques today are constantly changing. There is continuous search for new processes. Skilled trades are becoming more technical. Employers require that apprentice training today include a knowledge of latest methods and technical "know-how", both practical and theoretical. Training experts generally agree that such comprehensive training can only be carried out successfully by a properly organized and regulated system of apprenticeship which combines both school and "on-the-job" training. Organized and regulated training on a province-wide basis requires the cooperation of management, unions and government. The modern experts feel that only the passing of provincially standardized practical tests and written examinations can provide assurance that the standards attained are sufficiently high to warrant granting of journeyman status. The growing acceptance of this modern concept of apprenticeship has been aided by federal government assistance to apprentice training.

SECTION II

Alberta Apprenticeship Program

The Alberta Apprenticeship Program is a typical example of the newly conceived apprentice training system. The system is organized to provide every apprentice with the opportunity to attain certain standards of proficiency at the end of each year of apprenticeship. He must pass each year's practical tests and written examinations before proceeding on to his next year. Definite periods of apprenticeship are established in the different trades. However, the system is flexible enough for the exceptional youth to reach journeyman status in less than the normally required time. This is obtained by the acceleration of an apprentice's training upon the recommendation of his employer and his instructors at the trade training school.

Origin of Alberta Program

The present Alberta apprenticeship program came into existence with the passing of the Apprenticeship Act in 1944. The Act became effective in January, 1945. It was brought into effect largely as a result of recommendations of the Sub-committee on Industry of the Alberta Post-War Reconstruction Committee. The feelings of this sub-committee were expressed as follows in their report of March 1945:

"Until such time as educational science produces a type of education equal to the products of existing experience, it will be obvious that the only means whereby the student aspiring to executive position may acquire a working knowledge of the problems of labour will be through experiencing those problems himself. Therefore, it is the opinion of this sub-committee that the apprenticeship system, for the time being, must provide such experience for all who enter industry regardless of their personal abilities, educational advantages, or attributes of character and leadership.

"At this juncture, this sub-committee wishes to inform the Post-War Reconstruction Committee that it views with great satisfaction the fact that its recommendation of last year in this respect has been placed upon the Statutes of Alberta in the form of an Apprenticeship Act and expresses the hope that this Act will meet with the approval of industry, labour and the apprentices themselves. At the same time, it is necessary to point out that methods of mass production do not train youth in the broad practices of the skilled crafts and it will be increasingly necessary, therefore, to retrain many of those who, during wartime conditions, have received only a partial training in these crafts."

It is obvious from the foregoing extract from the sub-committee's report that this body viewed apprenticeship as a training ground for future executives as well as a method of producing journeymen. It can be seen also that they regarded modern mass production methods as insufficient training mediums. Thus arose the generally accepted idea of supplementing training on the job with practical and theoretical training at school.

Tradesmen's Qualification Act

The principle of qualifying as a journeyman by the passing of practical tests and examinations had been established in Alberta earlier by the passing of the Tradesmen's Qualification Act in 1936. Under the terms of this Act persons are prohibited from engaging in any trade to which the Act applies in any designated area or areas of the Province, unless such person holds a certificate of proficiency in his trade. There are certain exceptions in the Act where persons without certificates may work at the trade where it is not practicable to secure a certificated tradesman or for emergency work. However, while this Act necessitates the attainment of standards of proficiency, provable by examination before a tradesmen's certificate is issued, it does not make provision for training youth to enable them to attain the necessary standards. The Apprenticeship Act provides for the organization of such training.

At the time of writing the following trades were designated under both the Tradesmen's Qualification Act and the Apprenticeship Act:

1. Electricians
2. Motor Mechanics
3. Auto Body Workers
4. Plumbers
5. Steamfitters
6. Gasfitters
7. Radio and Television Technicians
8. Refrigeration mechanics

Those engaged in the above trades must hold a certificate of proficiency or completion of apprenticeship, or be registered as an apprentice, to work at the trade.

Administration of Program

Today, both the Apprenticeship Act and the Tradesmen's Qualification Act are administered by the Apprenticeship and Tradesmen's Qualifications Branch of the Department of Industries and Labour in Alberta. The present apprenticeship program started in a modest way in 1945 with the designation of seven skilled trades as coming under the terms of the new Apprenticeship Act. By the summer of 1956 there were 15 trades designated under the Act. These were: bricklayers, carpenters, electricians, painters and decorators, plasterers, plumbers, steamfitters, gasfitters, motor mechanics, auto body workers, welders, sheet metal workers, radio technicians, refrigeration mechanics and machinists.

Provincial Apprenticeship Board

Planners of the program realized that its success could only be attained by the cooperation of employers and organized labour. Therefore, representatives from industry and labour were invited to share with the government the responsibility for administering and regulating the system. The Apprenticeship Act called for

the establishment of a Provincial Apprenticeship Board to advise the Minister on all matters connected with the general conditions governing apprentices. The Board consists of five members, one representing industry, one from organized labour, one representing education, one member from the Department of Industries and Labour and a chairman appointed by the government.

Local Advisory Committees

A further opportunity for industry and labour to play an active part in the program lies in the establishment of local advisory committees in each trade, in every area where apprentices are employed. These local committees consist of four members with equal representation from both employers and labour in the trade. It is the function of these committees to hear complaints of employers and apprentices in matters pertaining to the training of apprentices and to make recommendations concerning such subjects to the Provincial Board. They also act as an examining board in cases where time credit is claimed for past experience.

Provincial Advisory Committees

In addition to the local committees in the various trades there is provision for a Provincial Advisory Committee in each designated trade or group of trades. These committees, established upon the recommendation of members of the trade concerned, are made up of two members from each of the local advisory committees. It is the function of these Provincial Committees to make regulations regarding the trade or trades they represent with respect to the following matters:

1. qualifications concerning the age of apprentices;
2. length of time for apprenticeship;
3. the number of apprentices who may be apprenticed to each employer;
4. the content of the courses to be given at the trades-training school or centre;
5. the establishment of standards of proficiency to be reached during each year of apprenticeship and the setting of the final standard of competency upon which journeyman status is granted; and
6. to conduct such practical tests and written examinations as may be deemed necessary to prove attainment of the desired standards.

It can be readily seen that by this method the control of proficiency in the trades is shared by both sides of industry, employers and labour. Uniformity of standards throughout the province is assured by leaving the setting of standards to one provincial committee in each trade or group of trades. This method appears to be conducive to a steady improvement of standards as members of the provincial committee, being themselves actively engaged in the trade, are aware of technological changes and can adjust standards to conform. This method also enables the school training to be kept up to date with the latest advances in the technical aspects of the trade. Provincial committees cannot, of course, make any regulations that would be inconsistent with or conflict with general regulations made by the Provincial Apprenticeship Board. Through the membership on the provincial board and committees at all levels, consisting of employer and labour representatives, industry exercises a large measure of control over the whole program.

Duties of Provincial Director

The Apprenticeship Act called for the appointment of a director to administer the program. His duties as outlined by the Act are manifold, they are:

1. to keep a register of every contract of apprenticeship entered into by an apprentice in accordance with the provisions of the Act;
2. to make such examination and inquiry as may be necessary to ascertain whether the provisions of the Act are being complied with by both employer and apprentice;
3. to arouse and promote interest in the adoption of apprenticeship in trades;
4. to assist in establishing a permanent system of training of apprentices in any trade;
5. to provide such information as may be required by the Provincial Apprenticeship Board;
6. to collaborate with educational authorities in the training of apprentices;
7. to submit a report annually to the Minister;
8. to generally perform such other duties and exercise such powers as may be prescribed by the Minister for carrying out the provisions of the Act.

Director of Apprenticeship and Staff

James P. White, B.Sc., has been the director of the program since its inception. He is assisted in administering the regulations and checking on the apprentices by a staff of field supervisors. Some of these supervisors, who are also skilled tradesmen in various trades, also act as instructors at the apprentice training classes at Calgary. Field supervisors work out of branch offices at Calgary, Lethbridge and Grande Prairie, as well as from the Head Office in Edmonton. By this system it is possible for every apprentice in the province to be interviewed on the job at least once a year. It is the responsibility of field supervisors to maintain a continuous check on the training on the job and to provide liaison with employers.

Immediately after his appointment in April 1945, Mr. White set about carrying out the third duty listed in the Act — arousing interest in the adoption of apprenticeship in trades. He found many employers hesitant at first to accept the idea that an organized apprentice training program was needed. For many years young men had learned trades by working with craftsmen, and some employers and journeymen questioned the need for an organized system. Gradually, however, this attitude changed until today there is evidence of widespread support from employers and organized labour.

Formation of First Committees

By June 1945, local and provincial advisory committees had been appointed for each of the following trades; bricklayers, carpenters, electricians, painters, plasterers, plumbers and sheet metal workers. Interest in, and enthusiasm for the new apprenticeship program were beginning to spread. Applications for designation under the terms of the Apprenticeship Act began to come in from other trades. The trade of motor mechanic soon became a designated trade.

Some difficulty arose as a result of the trade of motor mechanic becoming designated as an apprenticeable trade under the Alberta Apprenticeship Act. This trade had already been designated for some time under the Tradesmen's Qualification Act. Under the regulations of that Act a person was permitted to write examinations for a Certificate of Proficiency with only three years' practical experience. The regulations set up under the Apprenticeship Act called for a normal four-year apprenticeship. Solution to this problem and successive similar ones was found by placing the administration of the Tradesmen's Qualification Act for all trades which were also designated under the Apprenticeship Act with the Apprenticeship Branch. Regulations were then amended to avoid conflict and the Examining Boards previously established under the Tradesmen's Qualification Act were amalgamated with the advisory committees of the Apprenticeship Act.

Arrangement of Technical Training

The next problem facing the Director of Apprenticeship was the provision of technical training for the apprentices. Every advisory committee which had been set up requested the maximum three months of school technical training annually which was allowable under the Apprenticeship Act. The committees also asked that the school technical training be arranged insofar as possible between November 1 and April 30 of each year, the slack periods in most trades.

The War Emergency Training Program which had been used during World War II for training men in skilled trades for the armed services and war industries had become the Canadian Vocational Training Program. The facilities of this federal-provincial plan were being used to train World War II veterans for civilian trades. Since most of the apprentices registered under the new Apprenticeship Act were veterans the use of the schools of the Canadian Vocational Training Program were offered to the Apprenticeship Board. This offer was gladly accepted and the first technical training course commenced in the autumn of 1945.

The first apprentices to take technical courses were fitted into the pre-employment classes already in existence for veterans. It was stated that this did not prove entirely satisfactory, but it was a positive start on the program. In the meantime the various committees worked on analyses of their trades and the preparation of training syllabi.

Early Problems

The advisory committees had at the outset asked for three months of school technical training each year for each apprentice. However, this was found to be impractical as in every trade there was almost full employment all year. In this situation employers were reluctant to release apprentices for their annual school training. In view of this unexpected development the technical training period at school was temporarily reduced to as little as one month each year. The electrical course which had been drafted on the basis of three months at school each year was reduced to six weeks annually. Alberta officials give credit to the flexibility of the Canadian Vocational Training schools which enabled such adjustments to be made without having to discontinue effective training.

Despite all the difficulties which arose at the outset, the instruction at the schools got underway and showed steady improvement. It was not too long before both

employers and apprentices recognized the value of the school courses. As veteran training dropped off the closing of the Canadian Vocational Training schools began. Soon only the one in Calgary was operating. As it was impossible for the C.V.T. school in Calgary to handle the technical training for all apprentices other training centres were sought. This problem was solved by the Institute of Technology and Art in Calgary agreeing to take over some of the apprentice training.

Some adjustments were necessary as the Institute's school hours were shorter each day than those of the Canadian Vocational Training schools. However, these minor difficulties were overcome and classes at the Institute were begun for apprentices in motor mechanics and auto body work. At the present time the school technical training for all apprentices is divided between the Canadian Vocational Training School and the Institute of Technology and Art at Calgary. The C.V.T. school operates the classes for apprentices in bricklaying, plastering, painting and decorating, plumbing, steamfitting, gasfitting, and welding. The Institute gives the courses in motor mechanics, auto body work, sheet metal work, carpentry, electrical work, machinist work, radio and television, and refrigeration.

Terms of Apprenticeship

The apprentice training program now calls for four years including a three months' probationary period, of combined "on-the-job" and school technical training in most trades. The exceptions are welders, and radio and television technicians, who require three years; painters and decorators, three and one-half years; and the longest apprenticeship period of all, sheet metal workers with four years and nine months. As mentioned previously, however, it is possible for the exceptional apprentice, by accelerated training to attain his journeyman status in less than the normal time. Accelerated training is usually granted upon the recommendation of the employer and concurrence by the school instructor, but is subject to approval by the local advisory committee.

Time Credits

Credit on apprenticeship time may be granted to applicants for apprenticeship who have had related experience with the trade or vocational or technical training which is applicable. Usually a test is given and any time credit is based on the results. However, in some cases, an employer may recommend a time credit for one of his employees who applies for apprenticeship as a result of his experience with that employer. Such time credit is usually granted on a temporary basis subject to confirmation as a result of his showing during his first school course. Application for credits are submitted to the local advisory committee. It appears to be an established principle of the whole program to allow credit where it is genuinely deserved, regardless of where and how the applicant obtained the knowledge and experience upon which his claim is based.

Applicants for apprenticeship or journeyman status who have received training or experience outside Alberta are usually given a trade test to determine their degree of competence. However, in the case of journeymen who have certificates of competence from another province, proof of many years of experience, or union membership in good standing, a journeyman's certificate may be granted. Where an applicant for apprenticeship has completed technical training related to his trade in a school or

technical institute he may be given time credit on his apprenticeship and be excused from taking school courses covering the same work. For example, electrical apprentices who have successfully completed the two-year course in industrial electricity at the Institute of Technology and Art are exempted from all school technical training during apprenticeship. Similarly, motor mechanic apprentices who have completed the Institute's two-year course in automotive service engineering are exempted from all school technical training. Thus it can be seen that the Alberta apprenticeship program fully recognizes the value of pre-employment technical training in schools.

Noteworthy Feature

A noteworthy feature of the Alberta apprenticeship system is that in most trades there is no maximum age limit for apprentices. The exceptions are bricklaying and plastering, and even in these trades the age limits may be waived upon the recommendation of the local advisory committee. This feature encourages helpers, labourers and others who have been working with skilled tradesmen for some years on unskilled jobs to upgrade themselves to journeyman status by becoming apprentices. As previously mentioned the Tradesmen's Qualification Act prohibits anyone who is not a certificated journeyman or registered apprentice from working at a trade designated under that Act. Because of these regulations representatives of many of the trades felt that good potential journeymen from the ranks of helpers and labourers would be barred if age limits were established. As a result of the lifting of age limits many journeymen have begun their apprenticeship in their thirties and the occasional one in his forties.

Ratios of Apprentices to Journeymen

The number of apprentices who may be employed under the regulations of the Apprenticeship Act varies among the different trades. In the case of welders and plasterers one apprentice may be employed for every journeyman employed. The other trades vary from one apprentice to two journeymen as in the case of plumbers, steamfitters, gasfitters, and electricians, up to one apprentice to five journeymen in the case of carpenters.

Educational Requirements

The minimum educational standards required for entry to apprenticeship vary in different trades with grade 8 or the equivalent being the most common. Plasterers and painters require grade 9 and electricians grade 10. In other trades, for example, motor mechanics and sheet metal workers, there are no established minimum educational standards for apprentices. However, because of the technology required in these trades they are generally considered difficult for a boy to master without some high school education. Preference is likely to be given to those applicants with from two to four years of high school.

Employer's Responsibility

Responsibility for specific training on the job is accepted by an employer when he registers an apprentice and signs an apprenticeship contract. Through representation on the local committee and personal contact with field supervisors employers are made aware of what portion of the apprentice's training is to be given on the job.

Technical School Training

The length of compulsory technical school training for apprentices runs from four to eight weeks during each year of apprenticeship varying with the trade. This training, given at Calgary, consists mainly of detailed practical work combined with related classroom subjects. It is generally accepted in Alberta that instructors — who are themselves skilled journeymen — can teach the trade technology more readily than can the journeymen on the job. As one plumbing apprentice expressed it: "At work the journeyman does a job and we watch and assist. In the school we do the same job, step by step, slowly while the instructor watches every step and points out our mistakes. The next time we face that particular project at work we can approach it with confidence knowing we can do every part of the job properly."

Financial Allowances During School Training

During their period of school training each year apprentices receive an allowance from the Alberta Government amounting to \$12.00 weekly for single men and \$15.00 weekly for married men plus return transportation to Calgary. It is becoming a common practice for employers to supplement this allowance by amounts ranging from 50 to 100 per cent. Despite such compensation for loss of earnings during school training cases do occur where apprentices are reluctant to leave their jobs for the few weeks of school training. However, this reluctance does not appear to be shared by the majority. The unanimous opinion of one group who were interviewed was "that they were extremely fortunate to be able to attend school and get paid for it, even if the remuneration was considerably below their normal earnings".

SECTION III

Trades Designated Under the Act

It would seem appropriate to describe briefly the supplementary school technical training in each of the trades designated under the Apprenticeship Act and also to show the opinions of some employers and apprentices.

Bricklaying and Masonry Trades

Every apprentice bricklayer must attend the Canadian Vocational Training school at Calgary for three months during his first year of apprenticeship and for four weeks during his fourth and last year. Each apprentice is granted an annual certificate of progress if reports from the trade school and his employer are satisfactory.

Certificates of proficiency are not compulsory for journeymen bricklayers to engage in the trade although successful apprentices are granted a certificate of apprenticeship completion. However, application has been made to the Provincial Apprenticeship Board through the Provincial Advisory Committee to have certificates issued to qualified journeymen. This action would seem to indicate a recognition by the trade of the value of documentary proof of competence.

AN EMPLOYER'S COMMENTS

One Alberta man, who employs some 20 or more bricklayers and seven apprentices, in discussing the program, stated that if the apprentice program had not been started in 1945 the tremendous postwar construction activity in the Province could not have been carried out. He cited the Lethbridge area as an example of what he meant. He explained that immediately after World War II there were comparatively few bricklayers in the area and most of these were approaching 60 years of age and to his knowledge no apprentices were in training. He gave full credit to the organized apprenticeship program for improving the situation and making it possible for the construction industry to handle the expansion which had occurred in the last few years.

Carpentry

Apprentice carpenters attend the Institute of Technology and Art in Calgary for eight weeks during each year of apprenticeship — a total of 32 weeks of school technical training. The annual training of carpenter apprentices at the Institute consists of both practical and theoretical work, and related academic subjects. In the practical training emphasis is placed on giving the apprentice practice on phases of the trade which do not occur too frequently on most jobs. For example, stair and bannister building, both winding and straight, are taught step by step at the school.

With bungalows so popular in modern construction a boy may not get too much opportunity to learn stair building on the job. Contractors and those in the trade feel that a carpenter is not a skilled journeyman unless he can build stairs when the occasion arises. The apprentices are also taught at the school to read and understand blueprints, an essential phase of modern construction.

The carpenter trade is not designated under the Tradesmen's Qualification Act. Therefore employers may employ persons as carpenters who do not possess a certificate of proficiency. However, it appears to be a rapidly-spreading practice among contracting firms in Alberta to require certificates before hiring new carpenters. Authorities state that some companies have insisted that all carpenters without certificates in their employ take the necessary tests and examinations to obtain these certificates. In cases where such men fail to qualify they may then be graded as apprentices according to the results of the tests. This increasing practice among employers seems to indicate a growing recognition of the value of the organized training program.

AN EMPLOYER'S OPINION

D. G. Oland, President of Oland Construction Limited, an employer of many carpenters and apprentices in Southern Alberta, expressed an authoritative opinion on the Alberta apprenticeship program when he said: "We think generally the Apprenticeship Board of Alberta is doing a splendid job. We have in the past put through a large number of apprentices who have proved very successful. In fact, we have a few boys who went through their apprenticeship with us who are now holding jobs as foremen and superintendents. One man in particular, Douglas Ekman, is now a superintendent on contracts ranging close to a million dollars. In fact, we consider him to be one of our top superintendents.

"We also feel that two months basic training scheme, in lieu of the six months, will allow more boys to go through and take their training, as the six months basic training constituted quite a hardship to some of these boys."

Mr. Oland's comments give an indication of the opportunities for a successful career through apprenticeship. The case of Douglas Ekman, whom he mentions, is an interesting example. Mr. Ekman, who was originally from Saskatchewan, entered apprenticeship under the Veterans Apprentice training plan following his discharge from the Canadian Army after service in World War II.

Mr. Ekman qualified as a journeyman carpenter in 1948 and within a year was promoted to foreman on a hotel building job. Realizing that a greater knowledge of mathematics would be helpful to his career, he hired a tutor for two nights a week for four months. Apparently his resourcefulness and ambition proved worthwhile because in 1953 he was promoted to a superintendent. Mr. Ekman enthusiastically endorsed the Alberta apprenticeship program and had some sound advice for Canadian youth. He said:

"Get as much schooling as you possibly can, especially in mathematics, then, if for various reasons you cannot go on to university, become apprenticed to a skilled trade. It can lead to a lucrative and satisfying career."

Plastering

Supplementary school training for plastering apprentices consists of four weeks during the first year of apprenticeship and six weeks during the fourth and final year. It is possible for a youth, upon the recommendation of his employer, to take the final six weeks of trades school training during his third year. If his performance at the school and his work on the job warrant it he may be permitted to try his final tests for journeyman competency at the end of his third year.

In the practical work at the trade school the apprentice-plasterer is given practice in ornamental plastering and taught in detail each step of each process. Apprentices usually get plenty of practice at straight wall and ceiling work on the job, but opportunities to learn ornamental work are not too frequent. Therefore, the school training fills this gap, as a competent plasterer must know every type of work in the trade. Theoretical training is also given at the school.

OPINION OF AN EMPLOYER AND AN APPRENTICE

An employer, his foreman, one journeyman and four or five apprentices were interviewed in a group in Edmonton. The whole group were unanimous in their praise of the training system. The employer stated that his contracts called for a considerable variety of plastering work. However, there were some types of jobs which came along too rarely for the apprentices to learn them, yet it was essential that they become skilled in such jobs. He felt that the trade school performed a needed service in teaching the boys thoroughly those complex ornamental types of jobs. One apprentice, when asked what he thought of leaving the job to attend the trades school, replied: "Obviously, being a married man, I find some difficulty in managing financially, but what I learn at school makes the sacrifice well worthwhile, as I could not possibly get all that knowledge and practice on the job".

Sheet Metal Trade

As mentioned previously, there are no minimum educational standards established for entry to apprenticeship in the sheet metal trade. The general opinion of those in the trade, however, was that it was difficult for a boy without considerable high school education to master the technical aspects of the trade. It was pointed out by both contractors and journeymen that the trade was becoming more technical and complicated each year, thereby requiring increasing emphasis on mathematics and science.

The regulations respecting the sheet metal trade established the term of apprenticeship at four years. According to those in the trade four years proved too short a time for the average boy to master all the intricacies of the trade. Therefore, four years and nine months is recognized in Alberta today as the normal term of apprenticeship.

Sheet metal apprentices attend classes at the Institute of Technology and Art in Calgary for nine weeks during their first year of apprenticeship. Eight weeks of school attendance is required during each succeeding year making a total of 33 weeks. Fifty per cent of the school time is devoted to practical shopwork and the remainder is divided among such subjects as theory, mathematics, drafting, and science.

A sheet metal apprentice learns by doing at the Provincial Institute of Technology and Art in Calgary.



— Alberta Government Photograph

PRACTICAL WORK AT SCHOOL

The shopwork is designed to develop skills in the use and care of hand tools and measuring instruments and bench tools and machines such as uni-shear, electric drills, drill press, lockformer, bench grinder, flexible and shaft grinders and spot welders. The student apprentice is given extensive practice in such practical work as chimney thimbles, tee pipes, duct work, gutters and eavestroughing, soldering, vertical stitching, rivetting, furnace work, hipped skylights, blow pipe fittings, breeching and switching, mouldings and cornice work.

THEORETICAL AND ACADEMIC TRAINING

The lectures and instruction in theory cover all the theoretical aspects of the trade. Mathematics includes fundamental arithmetic such as fractions, decimals, linear measure, angular measure, averages, ratios, percentages, profit and loss, weights of materials and simple costing, square root, etc. Study is also given to basic geometry of circles, protractor work, triangles, geometric construction, bisection, perpendiculars, parallel lines, intersection of lines, construction of squares, rectangles, trapezoid arcs, formulae for perimeters, etc. Science studies cover chemical change, forms of matter, elements, compounds, mixtures, metals and alloys, fuels and combustion, specific gravity, heat conduction, convection and radiation, fluids and gravity, properties of air, force work power, atmospheric pressure and linear coefficient of expansion.

The need for supplementary school training is pointed up by the foregoing brief description. It would be virtually impossible for a sheet metal apprentice to acquire such detailed technical knowledge on the job. Yet journeymen and employers

in the trade stated emphatically that such knowledge was essential to the competent journeymen. The same situation applies to a greater or lesser degree in all Alberta's designated trades according to authorities there.

Plumbers, Steamfitters and Gasfitters

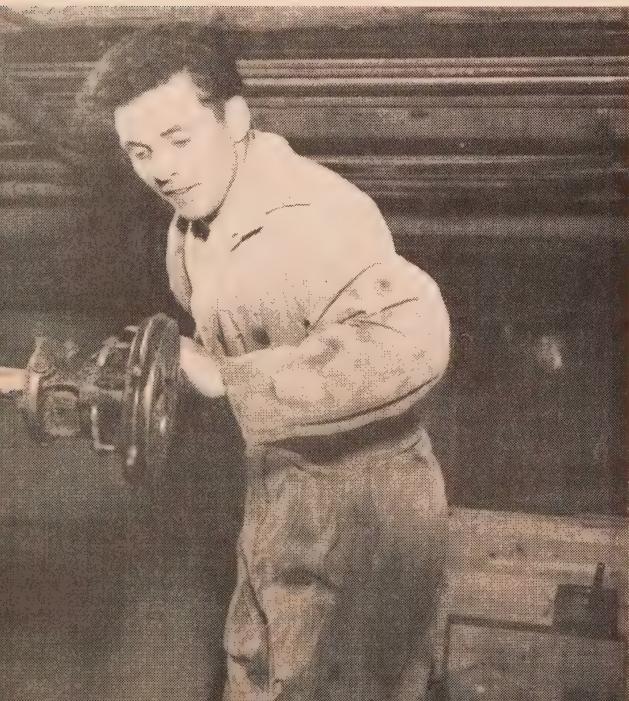
Although plumbing, steamfitting and gasfitting are designated as three separate trades under the Apprenticeship Act, certain types of technical or vocational training may apply equally to all three trades. Apprentices in all three trades attend the Canadian Vocational Training School for four weeks during each of the four years of apprenticeship. The early school training is similar in all three trades, but as the apprentices advance they specialize in their respective trades. Both practical and theoretical training and related mathematics are taught at the school.

A PLUMBING CONTRACTOR'S OPINION

The opinion of an employer concerning the Alberta Apprenticeship Program as it relates to the plumbing trades was expressed by Zeb Leigh, a plumbing and heating contractor of High River. Mr. Leigh learned the plumbing trade by a long-term apprenticeship in England many years ago. He has been in the business in Canada for 34 years. Said Mr. Leigh:

"Plumbing and heating is much more technical than it used to be. Because of this, practical experience on the job must be supplemented by technical and theoretical training at a school. It is very difficult for an apprentice to acquire the theoretical training on the job and a thorough knowledge of theory is essential to the modern plumber. It is essential, not only to give the journeyman a thorough knowledge and

— Alberta Government Photograph



*An apprentice
in the plumbing
course at the
Canadian Vocational
Training School
at Calgary.*

understanding of all aspects of the trade, but also to good customer relations. The customer of today's technical world wants to know exactly why this or that is done on a particular job. The plumber who can explain intelligently why each step is carried out inspires tremendous confidence in the customer. This is the best form of public relations an employer can have and absolutely essential in this highly competitive business. The Alberta apprentice training program recognizes this need in the training and fills the gap admirably with its full time courses at the trade school in Calgary. The system is a tremendous improvement over the old way of exposing a boy to the trade for a number of years and assuming he was then a skilled tradesman, sometimes he was, but too often he could do certain jobs in the trade well, but had not extensive knowledge or understanding of all aspects of the trade."

Painters and Decorators

Painting apprentices must attend courses at the Canadian Vocational Training school in Calgary. The school courses are of eight weeks duration in each of the first three years of apprenticeship. Although the normal term of apprenticeship is three and one-half years it is possible for the exceptional apprentice to obtain his journeyman's certificate at the end of three years. The attainment of this objective is dependent upon the apprentice's final school report and his employer's recommendation. The school courses consist of practical painting and paperhanging and related academic subjects.

An employer and two painting apprentices were interviewed in Calgary. It was their unanimous opinion that the existing school courses were essential to the production of a skilled painter and decorator. The employer explained that he could not teach his apprentices the details of many painting and decorating jobs, or the chemical knowledge of paints, or colour theory, the way they could at the school. He just had not the time. He went on to explain that one of the most important lessons the boys learned at the school was neatness and clean working habits. He stated that customers today will not stand for an untidy or sloppy workman who might make a mess in their home no matter how good a job he may make of the painting or paperhanging.

Electrical Trade

The regulations under the Alberta Apprenticeship Act respecting the electrical trade cover all forms of wiring and electrical installations. Every apprentice is required to attend classes at the Institute of Technology and Art in Calgary for eight weeks during each of the four years of apprenticeship. As previously mentioned graduates of the Institute's two year course in industrial electricity are exempted from the school training.

Half the total of 32 weeks or 960 hours of school classes are devoted to practical shopwork. The remaining 480 hours are spent on mathematics, theory, science, drafting, and general knowledge.



*A student
at work in the
electrical shop
of the Provincial
Institute of
Technology and Art
at Calgary.*

— Alberta Government Photograph

The mathematics taught, includes fundamental arithmetic and the use of the slide rule, trigonometric functions, angular measurement and the use of mathematical tables. The science studies involve British and metric systems of weights and measures, conversion factors and use; also the conversion of energy — potential and kinetic. The lectures in theory are related to the theoretical aspects of the practical work.

The Welding Trade

The welding trade in Alberta is not only subject to regulations concerning apprentices under the Apprenticeship Act, but is also governed by the Welding Act. This Act is administered by the Welding Branch of the Department of Industries and Labour. This branch is responsible for the issuance of proficiency certificates which may be of more than one class according to the provisions of the Act. However, the Welding Act does not provide for the training of apprentices. This function is left to the Apprenticeship Act. The trade of welding is defined for the purposes of the Apprenticeship Act as the joining together or cutting apart of metals in the molten state without the use of pressure or blows.

Under the Apprenticeship Act regulations respecting the welding trade, an apprentice who has completed three years apprenticeship and the required technical training and passes his final examinations is issued with a completion of apprenticeship certificate. However, this certificate does not entitle the holder to operate as a journeyman welder. He must then apply to the Welding Branch for a first class journeyman's certificate. Final year apprentices who pass their examinations in either acetylene welding or electric welding, but not both, are not entitled to a completion of apprenticeship certificate. However, such apprentices may apply to the Welding Branch for a first class journeyman's certificate in that branch of the trade in which the examinations were passed.

A welding apprentice who has completed two years of apprenticeship may apply to the Welding Branch to be examined for a second class journeyman's certificate in either acetylene or electric welding, or both. If the apprentice is successful in obtaining his second class certificate his apprenticeship is terminated, but he is not eligible for a completion of apprenticeship certificate. Later, after some experience as a second class journeyman, he may take the Welding Branch's tests and examinations for a first class certificate.

In addition to his practical experience on the job every welding apprentice is required to attend classes at the Canadian Vocational Training school in Calgary. These school courses consist of four weeks during each year of apprenticeship.

The training at the school consists of practical work and such related academic work as trade mathematics, applied physics, drawing, sketching and blueprint reading, general knowledge, allied trade processes, and an introduction to metallography and metallurgy.

SEVEN SPECIFIC OBJECTIVES

In its course outlines for the welding courses, the Canadian Vocational Training school outlines seven specific objectives. These are:

1. To train qualified journeymen welders for their job in Canadian industry with particular reference to Alberta.

A welding apprentice receives individual instruction at the Canadian Vocational Training School, Calgary.

— Alberta Government Photograph



2. To improve welding standards and trade qualifications.
3. To instill in the apprentice student a respect for his trade by emphasizing quality as well as quantity.
4. To upgrade the educational standards of welders and provide a foundation of related information on which the student may build to improve himself and his craft.
5. To provide a pool of skilled labour from which future specialists and foremen may be drawn.
6. To encourage cooperation, responsibility and industry in the student and thus foster happiness, satisfaction and a feeling of security in the tradesman.
7. To keep pace with industrial progress and the part that welding technology plays in modern industry.

Machinists

The trade of machinist was only designated under the Apprenticeship Act in June 1956. At the time of writing, regulations concerning age limits, ratio of apprentices to journeymen and length of time for apprenticeship, had not been issued. However, it was stated that the term of apprenticeship would be four years.

Arrangements for supplementary technical training for machinist-apprentices were made with the Provincial Institute of Technology and Arts in Calgary. The courses are of eight weeks duration during each year of apprenticeship, a total of 32 weeks. As in the case of other trades the courses will consist of a large percentage of practical shop work in the Institute's modern machine shop and related theoretical and academic classroom work. The Institute has for some years conducted a two-year industrial course in machine shop practice consisting of eight months each year. Machinist-apprentices who have successfully completed this course will be exempt from the 32 weeks of school training during their apprenticeship.

Radio and Television Technicians

The trade of radio and television technician or mechanic has the distinction of being one of only two designated trades in Alberta in which the principle of pre-employment training is used. The other trade is that of refrigeration mechanics. The normal term of apprenticeship is three years and no technical training at school is given after the apprentice starts to work. The pre-employment technical training consists of two years of eight months each at the Institute of Technology and Art in Calgary. Upon the recommendation of the employer an apprentice may be allowed a time credit up to two years on his apprenticeship for successful completion of his pre-employment technical training.

The technical training is given in a modern and well-equipped shop at the Institute. The two-year course consists of practical shopwork and related academic subjects. As the trade of radio and television technician is also designated under the Tradesmen's Qualification Act as well as the Apprenticeship Act, no one can work at the trade who is not a certificated journeyman or registered apprentice.

Refrigeration Mechanics

The trade of refrigeration mechanic like that of radio technician is designated under both the Tradesmen's Qualification Act and the Apprenticeship Act. Therefore, only certificated journeymen and registered apprentices may be employed at the trade. As in the case of radio technicians, pre-employment training is used in the organized training program.

The term of apprenticeship is four years. However, this time can include the apprentice's two years of pre-employment training upon the recommendation of his employer. The granting of one year's time credit to apprentices who have successfully completed their pre-employment training is automatic. The granting of the additional year is contingent upon the recommendation of the employer after the apprentice has been working for some months.

Pre-employment training is given in a two-year course at the Institute of Technology and Arts in Calgary. This course consists of eight months of 30-hour weeks each year, including both practical shopwork, trade theory and related subjects.

SECTION IV

Motor Vehicle Repair Trades

Motor Mechanics

Educational standards for motor mechanic apprentices appear to be at the discretion of the employer. However, employers questioned seemed to agree that a boy with less than grade 10 would have difficulty in successfully completing the technical training required. Among the employers interviewed, preference was given to applicants for apprenticeship with grades 11 or 12.

Every apprentice is required to attend classes at the Institute of Technology and Arts in Calgary for a total of 28 weeks or 840 hours. This school training is spread over the four years of apprenticeship: eight weeks each for the first two years; and six weeks each for the third and fourth years. Apprentices who have previously completed successfully the Institute's two-year course in automotive service engineering are exempted from the school training.

Students of motor mechanics under instruction in the automotive department of the Provincial Institute of Technology and Art at Calgary.

— Alberta Government Photograph



Half of the apprentice's time at the Institute is devoted to practical shop work. This practical work is carried out in a section of the school fitted out as a big garage with all the most up-to-date equipment. The apprentices do actual repair and overhaul work on automobiles. The remaining fifty per cent of the school time is spent on related subjects in adjoining classrooms. The academic subjects covered are theory, mathematics, science, and general knowledge. The mathematics taught ranges from fundamental arithmetic and geometry to bookkeeping, both the double entry and synoptic systems. The science studies include elementary heat and combustion principles, electricity and magnetism, elementary chemistry, elementary metallurgy, oxidation, electrolysis and ionization, inertia, motion, velocity, mass, weight, gravity, resolution and composition of forces, fluids and pressures and the principles underlying hydraulic and fluid drives.

Auto Body Workers

Every auto body apprentice is required to attend classes at the Institute of Technology and Arts for six weeks during his first year and four weeks in each of the second, third and fourth years, a total of 18 weeks or 540 hours. Two-thirds of the school time is spent on practical shop work divided between metal work, painting, welding, trimming and fitting. This work is carried out in a section of the Institute completely equipped as a large, modern auto body shop including a most modern paint drying room with controlled temperatures. The remaining one-third is devoted to theory related to the same divisions of the trade.

DIFFERENCES OF OPINION AMONG EMPLOYERS

There appears to be some difference of opinion concerning training among employers of motor mechanics and auto body workers in the province. They seem to agree that the system of combined on-the-job and school training is turning out good journeymen. However, the feeling was expressed that ways and means might be found of producing skilled mechanics faster.

This feeling was indicated by Reginald W. Ellis, Service Manager for Beny Chevrolet-Oldsmobile Limited in Lethbridge. Mr. Ellis supported the existing system of training and had several apprentices on the payroll at all times. He felt, however, that the present system would not prove adequate to meet the growing demand for skilled workers in the motor vehicle repair trades. He explained that the time was fast approaching when the volume of auto repairs and maintenance could only be handled on an assembly line basis. "Such a situation", he said, "requires specialists in various branches of the trade." He advocated progression toward a system whereby prospective apprentices could be given a thorough basic training in a school or special institution for whatever period of time was deemed necessary. With this thorough basic background the trainee could then enter training on the job and specialize in whatever branch of the trade he desired or for which he showed special aptitude.

Mr. Ellis also thought that more young men of high calibre might be attracted to the automobile business if they were aware of its career opportunities. He explained that well trained automobile mechanics frequently went on to become foremen, supervisors, service managers, salesmen and dealers. He stressed the importance of theoretical knowledge and felt that this could only be obtained properly at a school as there was not time on the job for the apprentice to acquire it.

Guy Heslip, a Mercury-Meteor dealer in High River, Alberta, agreed with the importance of theoretical training and the need for imparting such knowledge to an apprentice in school. Mr. Heslip, however, appeared satisfied with the existing system of four years of combined "on-the-job" and school training. He felt that an automobile mechanic had to be thoroughly trained in all aspects of automobile repair and overhaul before specializing in one branch of the trade. He explained that a specialist in one field like carburettion or automotive electricity might be extremely valuable in a big city garage, but that in smaller garages a good mechanic had to be able to do any repair work with equal facility.

Adolph Berg, Service Manager for Edmonton Motors (General Motors dealer in Edmonton) stated that the development of proper training was one of the most important problems facing the automotive vehicle repair industry today. He explained that the modern automotive field required continual training to keep mechanics abreast of technological changes. He said that to cope with this situation in his firm all mechanics were required to attend night classes at the shop. At these night sessions, discussions were carried on concerning new technological developments. The mechanics were also required to read the latest technical bulletins supplied by the industry and were periodically examined orally to see if they were familiar with latest developments.

Mr. Berg agreed on the importance of theoretical training and is a firm believer in the Alberta system of apprenticeship. He felt that apprentices should start work on the job and then attend school for so many weeks each year. He said the system was producing first class auto mechanics and auto body men for his firm. He felt there was a need for careful screening of prospective apprentices before starting them on apprenticeship. In his firm's employ were apprentices with Grades 11 or 12 education and he preferred a minimum of Grade 10 although he had made exceptions in certain cases. He stressed the need for a fair education and good knowledge of English in order that the apprentice could study intelligently the technical bulletins issued regularly in the automotive industry. It was Mr. Berg's opinion that all motor mechanic apprentices should first become competent journeymen with a thorough knowledge of every part of a car before specializing in one branch of the field.

ONE FIRM'S TRAINING SYSTEM

Mr. Berg went on to describe the rather unique method of starting apprentices in his firm. After careful interviewing the applicant is hired on probation. He is not registered as an apprentice at the start. He is made to understand that apprenticeship is a privilege and the right to step up to apprenticeship status must be earned. This pre-apprenticeship period may last from three months to a year or more, depending on vacancies according to the ratio of apprentices to journeymen, and on the boy's aptitude and potentiality. During this pre-apprenticeship period the boy does odd jobs such as selling gas and oil, washing windows, moving cars and assisting the journeymen and apprentices. They do not, of course, work on repair or overhaul, as under the Tradesmen's Qualification Act only certificated journeymen and registered apprentices may do such work.

All during this pre-training period the boy is watched carefully to see if he has the desire and ability required for a good mechanic. He also learns the terminology of the trade and becomes oriented to working conditions. The day he is registered as an apprentice he has a new status on the staff. He is given coveralls, a set of drills,

creeper, extension lights, and certain other equipment, and from that day on is exempt from all janitor work and car washing. His whole time then is spent working with skilled mechanics on vehicles. All apprentices are rotated every two months systematically between departments to insure thorough training in every phase of the trade. The firm makes sure every apprentice attends his annual school courses in Calgary, explained Mr. Berg.

The firm experienced no great difficulty in obtaining the right type of boys according to Mr. Berg. He explained that one reason for this was that even during their pre-apprenticeship period the boys received a higher rate of pay than the minimum established under the regulations for apprentices and kept at that rate with regular increases granted every six months until journeyman status and pay were reached. "Results are proving our carefully planned system successful", said Mr. Berg, "because our apprentices become first class mechanics and usually continue working for us for many years after they become journeymen".

SECTION V

Summary and Statistics

OUTSTANDING FEATURES

What appear to be the outstanding features of Alberta's modern apprenticeship system might be summarized as follows:

1. Acceptance of the modern Canadian concept of apprenticeship which recognizes the attainment of definite standards of practical skill and theoretical knowledge as journeyman status.
2. Recognition of the need for flexibility in training programs and the need for constant change to keep pace with modern technology.
3. Recognition of the need for the closest cooperation between organized labour, management, and government to insure the success of a provincial apprentice training program.
4. Acceptance of the principle that time credit should be allowed where it is genuinely deserved regardless of where or how the applicant obtained the knowledge and experience upon which his claim is based.
5. Recognition of the value of pre-employment trades training at a vocational or technical institute by its use in the two designated trades of radio and television technician and refrigeration mechanic.
6. Elimination of maximum age limits for entry to apprenticeship in all the designated trades except bricklaying and plastering and the waiving of maximum age limits in certain instances in these two trades.
7. Recognition of the value of certificates declaring competency.
8. Belief in practical trade tests and written examinations to prove attainment of competency.
9. Recognition of outstanding ability and diligence by the acceleration of an apprentice's training where it is deserved.
10. Belief in the need for thorough theoretical knowledge as well as practical trade skill before acceptance of journeyman status.
11. Belief that an organized apprentice training system based on the modern concept can provide youth with opportunities for a lucrative and satisfying career as well as maintaining a supply of skilled manpower.

STATISTICS

The following table indicates the number of apprentices in training in Alberta in all the 15 trades designated under the Alberta Apprenticeship Act in September 1956:

TRADE	YEAR OF APPRENTICESHIP				
	First	Second	Third	Fourth	Total
Bricklayers	22	18	3	27	70
Carpenters	121	38	18	66	243
Electricians	174	94	80	129	477
Painters and Decorators	28	18	9	8	63
Plasterers	58	27	1	28	114
Plumbers	117	89	77	112	395
Steamfitters	19	12	17	32	80
Gasfitters	4	—	—	—	4
Motor Mechanics	353	201	143	226	923
Auto Body Workers	103	51	38	84	276
Welders	406	196	148	2	752
Sheet Metal Workers	52	60	63	31	206
Radio Technicians	16	9	11	1	37
Refrigeration Mechanics	5	—	2	2	9
Machinists	8	—	—	—	8
TOTAL	1,486	813	610	748	3,657

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Nov 15 59	NAME OF BORROWER
	Karen Kent

Edmond Cloutier, C.M.G., O.A., D.S.P.
Queen's Printer and Controller of Stationery
Ottawa, 1957